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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.: 10/606,131      Confirmation No.: 4021  
Applicant(s): Doe, Steve  
Filed: 06/24/2003  
Art Unit: 2871  
Examiner: Wang, George Y.  
Title: Display Device  
  
Attorney Docket No.: 884A.0005.U1(US)  
Customer No.: 29,683

Commissioner For Patents  
P.O. Box 1450  
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Appeal Brief

Sir:

This is an appeal brief in regard to the final rejection of claims in the above-identified patent application. A Notice of Appeal was mailed to the USPTO on 9/12/2005. The fee under 37 C.F.R. §41.20(b)(2) is enclosed. Please charge deposit account 50-1924 for any fee deficiency.

I. Real Party In Interest

The real party in interest is Nokia Corporation.

II. Related Appeals and Interferences

There are no directly related appeals or interferences regarding this application.

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### III. Status Of Claims

Claims 1-24 are pending in this application. Claims 1-20 and 23 have been rejected by the Examiner. Claims 21-22 and 24 have been withdrawn. The rejection of Claims 1-20 and 23 is appealed.

### IV. Status Of Amendments

Since the final rejection of 05/17/2005 no amendments have been filed. A response to the office action of 05/17/2005 was filed on 07/06/2005, but it did not contain amendments.

### V. Summary of Claimed Subject Matter

Embodiments of the present invention provide a display device (100) comprising a first electrode (108); a liquid crystal layer (18) positioned under and connected to the first electrode; a second electrode (113); a switchable optical layer (112), having a transparent state and a non-transparent state and being electrically switchable between the transparent state and the non-transparent state, positioned above and connected to the second electrode; and a third electrode (110) positioned between the liquid crystal layer (18) and the switchable optical layer (112). (Fig. 3 and Page 4, line 29 - page 5, line 17) (page 5, lines 24-27; page 6, lines 2-21; and page 6, line 23 - page 7, line 14.).

In a first embodiment, the non-transparent state of the switchable optical layer (112) is a reflective state. In a second embodiment the non-transparent state of the switchable

optical layer (112) is a selectively emissive state (Page 7, line 15 - 17, and page 9, lines 8-17).

#### VI. Grounds of Rejection to be Reviewed on Appeal

Are claims 1-20 and 23 unpatentable under 35 U.S.C. §103(a) over Leibowitz et al. (US 4,500,173) in view of Weber et al. (US 5,686,979)?

#### VII. Argument

#### **35 U.S.C. §103(a) - Leibowitz et al. (US 4,500,173) in view of Weber et al. (US 5,686,979)**

##### Claim 1

Claim 1 claims a display device comprising a switchable optical layer. In the Advisory Action mailed 07/27/2005 the examiner indicated that he was not giving the term "switchable" any patentable weight. This is clearly an error. The claim language must be considered "as a whole". As noted in the MPEP at Section 2106 "...when evaluating the scope of a claim, every limitation in the claim must be considered. Office personnel may not dissect a claimed invention into discrete elements and then evaluate the elements in isolation. Instead, the claim as a whole must be considered. See, e.g., Diamond v. Diehr, 450 U.S. at 188-89, 209 USPQ at 9. The examiner has openly admitted that he has not been doing this in this case because he has not given patentable weight to the term "switchable". The Board is also directed to MPEP §2173.05(g). A function limitation is an attempt to define

something by what it does, rather than by what it is. There is nothing inherently wrong with defining some part of an invention in functional terms. A functional limitation **must be evaluated and considered**, just like any other limitation of the claim.

Claim 1 claims that the switchable optical layer has either a transparent state or a non transparent state, and is electrically switchable between the transparent state and the non transparent state. The non transparent state is a reflective state or a selectively emissive state. The switchable optical layer is positioned above and connected to the second electrode. These features, in combination with the other features of claim 1, are not disclosed or suggested in the art of record.

Leibowitz et al. discloses in Fig.4, a display device 10c and a liquid crystal layer 16 sandwiched between an upper electrode and a common electrode 24 and an electroluminescent (EL) layer 26 sandwiched between the common electrode 24 and bottom electrode 28. In Leibowitz, the EL layer 26 is the only layer that could be the 'switchable optical layer'. The EL layer is either OFF (transparent) or ON (emissive). There is no disclosure of a non-transparent state that is reflective or one that is selectively emissive.

In the present invention "the pixel switches 130 supply the voltage or current necessary to enable overlying portion of the switchable optical layer to emit light ... by the selective enablement of the pixel switches 130, selective portions of the switchable optical layer 124 will emit light to produce an image on the display device 120." (page 9, lines 5-9) In

Leibowitz, when EL layer 26 is ON, the entire layer is emissive; not just selective pixels as in the present invention.

Leibowitz fails to disclose a switchable optical layer with a non-transparent state that is either reflective or selectively emissive.

Weber et al. discloses a pixellated LCD display (Fig.9) comprising a liquid crystal 142, a switchable translector 136 and a backlight 132. If the Examiner interprets the "switchable translector" 136 (col.9, line 26) to be the 'switchable optical layer' then, there is no disclosure of the switchable optical layer being positioned above and connected to a second electrode as there is no underlying electrode that is separate to the switchable translector 136. There is also no disclosure that the switchable translector 136 is selectively emissive.

If the Examiner interprets the switchable optical layer as the "liquid crystal device" 146 (col.12, line 15), then there is no disclosure of the switchable optical layer being positioned above and connected to a second electrode as there is no underlying electrode that is separate to the liquid crystal device 146. Also, according to this interpretation the reflective polarizer 148 is not part of the 'switchable optical layer'. From Figure 11 it is clear that the reflective polarizer 148 is the only component that is reflective. Therefore, in this interpretation there is no disclosure of a switchable optical layer that is reflective or selectively emissive.

If the Examiner interprets the liquid crystal material 154 as "the switchable optical layer" (col.12, line 10), then the switchable optical layer is positioned above and connected to a second electrode 158, however this interpretation does not provide the switchable optical layer with a transparent and non-transparent state or a non-transparent state that is reflective or selectively emissive.

It should now be apparent that the present invention as defined by the independent claims is, therefore, not disclosed in the cited documents and is novel.

As both documents do not disclose a switchable optical layer that is positioned above and connected to a second electrode and that has a transparent state and non-transparent state, where the non-transparent state is a reflective state or a selectively emissive state, it is not possible to combine the documents to arrive at the present invention.

The present invention as defined by the independent claims is therefore non-obvious in view of the prior art. Neither Leibowitz et al. nor Webber et al., alone or in combination, disclose or suggest applicant's invention as claimed in claim 1.

The Examiner has alleged in paragraph 6 of the office action dated 05/17/2005 that we argued that the prior art does not teach or suggest a "switchable optical layer". This is incorrect. We argued that the prior art does not teach or suggest "a switchable optical layer that is positioned above and connected to a second electrode and that has a transparent

sate and non-transparent state, where the non-transparent state is a reflective state or a selectively emissive state".

The Examiner alleges, by quoting Merriam-Webster's Collegiate Dictionary (10th Ed.) "the definition of 'reflect' is 'to give back or exhibit likeness'. Thus, when something phosphoresces - it take in light and 'gives back' the likeness of light, it clearly satisfies Applicant's claimed 'reflective state'."

The Examiner's quoted definition of "reflect" does not correspond to the definition given in Merriam-Webster OnLine which states that one of the definitions of "reflect" is "to give back or exhibit as an image, likeness or outline". The OnLine definition of the word "reflect", excludes phosphorescence which does not take in light, and give back as an image the likeness of light. Phosphorescence is a form of luminescence which requires excitation. It is **not** a form of reflection. It is persistent emission of light following exposure to and removal of incident radiation.

The Examiner's comments in paragraph 6 are in contradiction to what the Examiner has previously stated in the office action dated December 1, 2004. In paragraph 1 of that office action, the Examiner stated "In the present case, species 2 and 3 do not contain a commonality of operation, function or effect since one's [sic] non-transparent state is reflective and the other is selectively emissive." The Examiner clearly understood that a reflective state and a selectively emissive state do not share any commonality of operation, function or effect. Therefore, by alleging that phosphorescence in Leibowitz satisfies the claimed "selectively emissive" state

in the last office action and the claimed "reflective state" in this office action, the Examiner is contradicting himself.

Furthermore, MPEP 2111 states that "claims must be given their broadest reasonable interpretation consistent with the specification." MPEP 2111.01 also states "the words of a claim must be given their "plain meaning" unless they are defined in the specification". Therefore, contrary to what the Examiner states, "since neither Applicant's specification or claims preclude such an interpretation", MPEP makes it clear that an interpretation cannot be justified simply because the specification or claims do not preclude it, indeed the specification and claims must define a word if a meaning is to be given that is anything other than its plain meaning. There is nothing in the specification to suggest that "reflective" should be given anything other than its plain meaning, which is clearly excludes phosphorescence.

MPEP 2111.01 continues "In the absence of an express intent to impart a novel meaning to the claim terms, the words are presumed to take on the ordinary and customary meanings attributed to them by those of ordinary skill in the art." A person of ordinary skill in the art, in view of the specification would interpret the term "reflective state" in claim 1 to mean a state in which passage of light is prevented and caused to change direction. Therefore, phosphorescence cannot be interpreted to satisfy the claimed reflective state as alleged by the Examiner.



#### Claim 2

Claim 2 claims that the third electrode is shared by the liquid crystal layer and the switchable optical layer. Contrary to the examiner's statements, Leibowitz et al. does not disclose that the electrode 24 is shared by the layers 16, 26. Electrode 20 is between the electrode 24 and the layer 16.

#### Claim 3

Claim 3 claims that the second and third electrodes are either both pixellated or both unitary. This is not disclosed or suggested in Leibowitz et al.

#### Claim 4

Claim 4 claims that at least one of the first, second or third electrodes is pixellated and has associated pixel switches. This is not disclosed or suggested in Leibowitz et al.

#### Claim 5

Claim 5 claims that the non-transparent state of the switchable optical layer (16) is a reflective state. This is not disclosed or suggested in Leibowitz et al.

Claims 6, 9 and 10 stand or fall with claim 5.

#### Claim 7

Claim 7 claims that the first electrode is a pixellated transparent electrode comprising a plurality of distinct electrodes. This is not disclosed or suggested in Leibowitz et al.

Claim 8

Claim 8 claims pixel switches positioned above the pixellated transparent electrode, such that each one of the pixel switches is connected to one of the plurality of distinct electrodes. This is not disclosed or suggested in Leibowitz et al.

Claim 11

Claim 11 claims a first polariser positioned above the first electrode, a second polariser, crossed with the first polariser, positioned under the second electrode, and a backlight positioned under the second polariser. This is not disclosed or suggested in Leibowitz et al. and Weber et al. A person skilled in the art would not look to modify the device disclosed in Leibowitz et al. based upon the device described in Weber et al.

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. (see MPEP 2143.01, page 2100-98, column 1). The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination (see MPEP 2143.01, page 2100-98, column 2). A statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the

references relied upon teach that all aspects of the claimed invention were individually known in the art is **not sufficient** to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. (see MPEP 2143.01, page 2100-99, column 1) Ex parte Levengood, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). >See also Al-Site Corp. v. VSI Int'l Inc., 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999) (The level of skill in the art cannot be relied upon to provide the suggestion to combine references.)

In the present case, there is no suggestion to combine the two references to render the features of claim 11 obvious.

#### Claim 12

Claim 12 claims control means arranged to vary the voltage across the switchable optical layer and to control a backlight. This is not disclosed or suggested in Leibowitz et al. Is "16" in Leibowitz et al. the switchable optical layer or the backlight? If it is the switchable optical layer, where is the backlight? Where is the control means arranged to vary the voltage across the switchable optical layer **and** to control a backlight.

#### Claim 13

Claim 13 claims that the non-transparent state of the switchable optical layer is a selectively light emissive state. This is not disclosed or suggested in Leibowitz et al.

Claims 14, 17 and 18 stand or fall with claim 13.

#### Claim 15

Claim 15 claims that the second electrode is a first pixellated electrode connected to the switchable optical layer comprising a first plurality of first distinct electrodes and the third electrode is a second pixellated electrode connected to the switchable optical layer comprising a first plurality of second distinct electrodes, wherein each one of the first distinct electrodes opposes an associated second distinct electrode across the switchable optical layer. This is not disclosed or suggested in Leibowitz et al.

#### Claim 16

Claim 16 claims pixel switches positioned below the second electrode, such that each pixel switch is connected to one of the plurality of first distinct electrodes. This is not disclosed or suggested in Leibowitz et al.

#### Claim 19

Claim 19 claims control means arranged, in a first mode, to maintain the second distinct electrodes of the third electrode at the same voltage and, in a second mode, to maintain each second distinct electrode of the third electrode at the same voltage as its associated first electrode of the second electrode. This is not disclosed or suggested in Leibowitz et al.

#### Claim 20

Claim 20 claims a first polariser positioned above the first electrode, a second polariser, crossed with the first

polariser, positioned under the second electrode, and a backlight positioned under the second polariser. This is not disclosed or suggested in Leibowitz et al. and Weber et al. A person skilled in the art would not look to modify the device disclosed in Leibowitz et al. based upon the device described in Weber et al. The Board is directed to the arguments presented above with respect to claim 11.

#### Claim 23

Claim 23 claims a display device comprising a switchable optical layer. Again, in the Advisory Action mailed 07/27/2005 the examiner indicated that he was not giving the term "switchable" any patentable weight. This is clearly an error. The claim language must be considered "as a whole". Claim 23 claims that the switchable optical layer has either a transparent state or a non transparent state, and is electrically switchable between the transparent state and the non transparent state. The non transparent state is a reflective state. The switchable optical layer is positioned above and connected to the second electrode. This in combination with the other features of claim 23 are not disclosed or suggested in the art of record.

#### VIII. Claims Appendix

Attached.

#### IX. Evidence Appendix

None.



X. Related Proceedings Appendix

None.

Conclusion

In view of the arguments presented above, it is respectfully requested that the Examiner's rejections of Claims 1-20 and 23 be reversed.

Respectfully submitted,

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10/27/05  
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## CLAIMS APPENDIX



1. A display device comprising:  
  
a first electrode;  
  
a liquid crystal layer positioned under and connected to the first electrode;  
  
a second electrode;  
  
a switchable optical layer, having in use either a transparent state or a non transparent state and being electrically switchable between the transparent state and the non transparent state, wherein the non transparent state is a reflective state or a selectively emissive state and the switchable optical layer is positioned above and connected to the second electrode; and,  
  
a third electrode positioned between the liquid crystal layer and the switchable optical layer.
2. A display device as claimed in claim 1 wherein the third electrode is shared by the liquid crystal layer and the switchable optical layer.
3. A display device as claimed in claim 2 wherein the second and third electrodes are either both pixellated or both unitary.
4. A display device as claimed in claim 1 wherein at least one of the first, second or third electrodes is pixellated and has associated pixel switches.



5. A display device as claimed in claim 1 wherein the non-transparent state of the switchable optical layer is a reflective state.
6. A display device as claimed in claim 5 wherein the switchable optical layer is arranged to be switched as a whole.
7. A display device as claimed in claim 5 wherein the first electrode is a pixellated transparent electrode comprising a plurality of distinct electrodes.
8. A display device as claimed in claim 7 further comprising pixel switches positioned above the pixellated transparent electrode, such that each one of the pixel switches is connected to one of the plurality of distinct electrodes.
9. A display device as claimed in claim 5 wherein the second and third electrodes are unitary electrodes.
10. A display device as claimed in claim 9 wherein the unitary electrodes are transparent.
11. A display device as claimed in claim 5 further comprising a first polariser positioned above the first electrode, a second polariser, crossed with the first polariser, positioned under the second electrode, and a backlight positioned under the second polariser.
12. A display device as claimed in claim 1 further comprising control means arranged to vary the voltage across the switchable optical layer and to control a backlight.

13. A display device as claimed in claim 1 wherein the non-transparent state of the switchable optical layer is a selectively light emissive state.

14. A display device as claimed in claim 13 wherein the first electrode is a unitary transparent electrode.

15. A display device as claimed in claim 13 wherein the second electrode is a first pixellated electrode connected to the switchable optical layer comprising a first plurality of first distinct electrodes and the third electrode is a second pixellated electrode connected to the switchable optical layer comprising a first plurality of second distinct electrodes, wherein each one of the first distinct electrodes opposes an associated second distinct electrode across the switchable optical layer.

16. A display device as claimed in claim 15 further comprising pixel switches positioned below the second electrode, such that each pixel switch is connected to one of the plurality of first distinct electrodes.

17. A display device as claimed in claim 13 wherein the third electrode is transparent.

18. A display device as claimed in claim 13 wherein the second electrode is reflective.

19. A display device as claimed in claim 15 further comprising control means arranged, in a first mode, to maintain the second distinct electrodes of the third electrode at the same voltage and, in a second mode, to maintain each second distinct electrode of the third electrode at the same

voltage as its associated first electrode of the second electrode.

20. A mobile device comprising a power supply and a display device, as claimed in claim 1.

21. (Withdrawn) A method of controlling a display device comprising a liquid crystal layer and an underlying transparent/reflective layer which is either uniformly transparent or uniformly reflective, to operate in a first mode by:

selectively controlling portions of the liquid crystal layer and

uniformly maintaining the transparent/reflective layer in a transparent state, and

to operate in a second mode by:

selectively controlling portions of the liquid crystal layer and

uniformly maintaining the transparent/reflective layer in a reflective state.

22. (Withdrawn) A method of controlling a display device comprising a liquid crystal layer and an underlying transparent/emissive layer which is selectively either transparent or emissive, to operate in a transmissive mode by:

selectively controlling portions of the liquid crystal layer and

uniformly maintaining the transparent/emissive layer in a transparent state, and

to operate in an emissive mode by:

uniformly controlling the liquid crystal layer and

selectively enabling portions of the transparent/emissive layer so that the selected portions emit light.

23. A display device comprising:

a first electrode;

a liquid crystal layer positioned under and connected to the first electrode;

a second electrode;

a switchable optical layer, having in use either a transparent state or a non transparent state and being electrically switchable between the transparent state and the non transparent state, wherein the non transparent state is a reflective state and the switchable optical layer is positioned above and connected to the second electrode; and,

a third electrode positioned between the liquid crystal layer and the switchable optical layer.

24. (Withdrawn) A display device comprising:

a first electrode;

a liquid crystal layer positioned under and connected to the first electrode;

a second electrode;

a switchable optical layer, having in use either a transparent state or a non transparent state and being electrically switchable between the transparent state and the non transparent state, wherein the non transparent state is a selectively emissive state and the switchable optical layer is positioned above and connected to the second electrode; and,

a third electrode positioned between the liquid crystal layer and the switchable optical layer.